

Applicant : Jei-Fu Shaw, et al.,
Serial No. : 10/782,287
Filed : February 19, 2004
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Attorney Docket No.: 70002-104001
Client Ref. No.: 09A-911128

REMARKS

The present document is submitted in reply to the final Office Action dated May 14, 2008 (“Office Action”).

Claims 14-16, 18-20, and 31-44 are pending. Applicants have amended claim 14 to more particularly and distinctly point out the subject matter that they deem as their invention. Support for the amendments can be found in the specification at page 7, lines 6-24. These amendments have necessitated amendments to claims 16 and 19. Further, Applicants have cancelled claims 37-44 and added new claims 45-52, support for which appears in original claims 14-16, 18-20, and in the specification at page 7, lines 6-24. No new matter has been introduced.

Upon entry of the present amendments, claims 14-16, 18-20, and 45-52 will be pending and under examination. Applicants respectfully request that the Examiner reconsider this application in view of the following remarks.

Rejections under 35 U.S.C. § 112, First Paragraph (Written Description)

Claims 14-16, 18-20, and 31-44 are rejected for lack of written description. See the Office Action, page 3, second paragraph. More specifically, the Examiner holds that the specification provides no support for the terms “up to five days” and “for 3-5 days,” each recited in certain rejected claims. In other words, this is a new matter rejection.

For the sole purpose of facilitating prosecution, Applicants have amended independent claim 14 to replace the term “up to five days” with the term “for five days,” which has literal support in the specification (see page 7, line 22). Further, Applicants have cancelled claims 37-44, some of which recite the term “for 3 to 5 days.” Note that claims 15, 16, and 18-20, dependent from claim 14, do not recite any of the two terms at issue.

It is submitted that the just-mentioned amendments have obviated the rejection.

Rejections under 35 U.S.C. § 103

The Examiner rejects claims 14-16, 18-20, and 31-44 for obviousness on two grounds. See the Office Action, pages 4-8. Applicants have cancelled claims 31-44 and will address the two separate grounds as applied to claims 14-16 and 18-20.

I

Claims 14-16 and 18-20 are rejected as obvious over Seidman et al., US Patent 3,551,293 (“Seidman”) in view of Iwano et al., JP Patent Application 09-074374 (“Iwano”). See the Office Action, pages 4-6.

Independent claim 14 will be discussed first. This claim, as amended, covers a method of producing a fermentation product, including (1) a dual-enzyme process for preparing a glucose-rich syrup from starch and (2) a fermentation process in which the syrup is treated with *Aspergillus oryzae* for five days to produce a fermentation product containing 13.5% ethanol.

Seidman teaches a dual-enzyme process for converting starch to low molecular weight-saccharides such as dextrose and maltose. See column 3, lines 51-54. The Examiner correctly pointed out that this reference does not teach any fermentation process. See the Office Action, at page 4, third paragraph. She however holds the position that Iwano, which discloses a fermentation process for producing Japanese sake, makes up for the deficiency of Seidman. See the Office Action, pages 4-6.

Applicants would like to bring to the Examiner’s attention a difference between the fermentation process taught in Iwano and that required by the method of claim 14, as amended. Namely, the Iwano fermentation process uses **yeast** (see paragraphs [0043] and [0044]) while the fermentation process in the claimed method uses ***Aspergillus oryzae***. For the reasons set forth below, Applicants submit that this difference is not merely an obvious variation with respect to usage of different fermentation microorganisms.

As noted above, the Iwano fermentation process is designed for making Japanese sake. It is known in the art that, when brewing Japanese sake, rice starch is first converted to glucoses with enzymes derived from *Aspergillus oryzae* and the glucoses are

then fermented with **yeast** to produce sake. See Wu et al., *Applied and Environmental Microbiology*, 2006, 72:7353-7358; copy attached as Exhibit A. In view of this common knowledge, a skilled person in the art would have readily known that **yeast**, but not *Aspergillus oryzae*, is the fermentation microorganism used for brewing sake. Iwano does not mention any fermentation microorganisms other than yeast, let along suggest that *Aspergillus oryzae* be used as a fermentation microorganism for making sake. Absent such a suggestion, a skilled artisan would not have been motivated to modify the Iwano fermentation process by replacing **yeast** with *Aspergillus oryzae*, thereby reaching the fermentation process recited in amended claim 14. As pointed out above, Seidman has nothing to do with fermentation. Thus, contrary to the Examiner's position, the combination of Seidman and Iwano does not render amended claim 14 obvious. Nor does it render obvious claims 15, 16, and 18-20, all of which depend from claim 14.

II

Claims 14-16 and 18-20 are rejected for obviousness over Seidman in view of Skory et al., *Biotechnology Letters*, 19:203-206 ("Skory"). See the Office Action, pages 7-8.

Amended claim 14 has been discussed at page 7, *supra*. Applicants particularly would like to point out that this claim requires **fermenting** a glucose-rich syrup with *Aspergillys oryzae* for **five** days to obtain a fermentation product containing **13.5%** ethanol.

As discussed above, Seidman discloses conversion of starch to low molecular weight-saccharides. Skory discloses screening for ethanol-producing filamentous fungi, including *Aspergillys oryzae*. See the title and Table 1 at page 204. The Examiner thus concludes that the combination of these two references would have rendered claim 14 obvious.

As set forth in MPEP § 2141, "[w]hen considering obviousness of a combination of known elements, the operative question is [] 'whether the **improvement is more than** the **predictable** use of prior art elements according to their established functions;'" citing *KSR v. Teleflex*, 127 S. Ct. 1727, 1740.

In this case, Skory teaches that *Aspergillus oryzae* produces **1.59-2.44 %** ethanol in a 6-day fermentation period, using glucose as the carbon source.¹ See Table 1 at page 204. Sideman does not mention at all ethanol-producing fermentation, let along ethanol production rate of *Aspergillus oryzae*. Thus, in view of these two references, a skilled person would have expected that using *Aspergillus oryzae* to ferment glucose in 6 days would produce **at best 2.44 %** ethanol.

As discussed above, the method of amended claim 14 includes a fermentation process of using *Aspergillus oryzae* to ferment a glucose-rich syrup for five days (one day shorter than the 6-day period disclosed in Skory). The fermentation product prepared by this process contains **13.5 %** ethanol in five days, which is far higher than what a skilled artisan would have predicted based on Sideman and Skory, i.e., **at best 2.44 %** in six days. This clearly is an **unpredictable** improvement in view of Sideman and Skory. Thus, pursuant to the guideline set forth in MPEP § 2141 and quoted above, amended claim 14 is not obvious in view of these two references. Nor are claims 15, 16, and 18-20, all of which depend from claim 14.

III

In view of the above remarks, Applicants respectfully request that the Examiner withdraw this rejection.

New Claims

Applicants have added new claims 45-52, support for which has been pointed out at page 6, supra. It is thus submitted that these claims do not include new matter.

Similar to amended claim 14, new claim 45 also includes a fermentation process, in which a glucose-rich syrup is treated with *Aspergillus oryzae* for 3 days to produce a fermentation product containing 10.5% ethanol. For the same reasons set forth above, Applicants submit that this claim is not obvious over Sideman in view of Iwano or Skory. Nor are claims 46-52, all dependent from claim 45.

¹ According to Table 1 in Skory, *Aspergilli oryzae* produces 15.9 – 24.4 g/l ethanol at day 6, which amount to 1.59 – 2.44 % (g/100 ml) ethanol.

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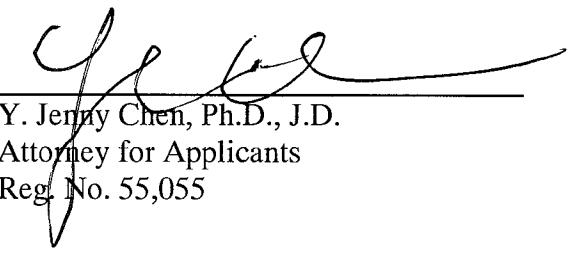
CONCLUSION

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

The Petition for Extension of Time fee in the amount of \$ 120 is being paid concurrently herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other charges or credits to Deposit Account No. 50-4189, referencing Attorney Docket No. 70002-104001.

Respectfully submitted,

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